M/035/009

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Consulting Engineers and Scientists

FAX TRANSMITTAL FORM

TO: Dept. Natural Resources; Division of Oil Gas & Mining

ATTENTION: Mr Holland Sheppard

FAX NUMBER: 1 801 359 3940

FROM: Dr David Morrey

SUBJECT: Biosolids application - Barneys Canyon Mine

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DATE: 15 November 1993

PROJECT NO.: 29505

Dear Holland

I have been contacted by Barneys Canyon Mine in connection with the seeding program for the 6400/6500 waste rock dump. Following a query from your office, the mine has requested that I explain the absence of tree and shrub species from our 1993 hydraulic seeding mixture, to be applied on the biosolids demonstration plot.

From our experience with other, similar studies, we have noticed that woody species establishment has been relatively poor when tree and shrub seeds have been sprayed simultaneously with grass and forb seeds. We believe this to be a result of aggressive competition during the early emergence and establishment stages, when the faster growing grass species tend to exclude slower species.

Generally, we achieve significantly better results when tree and shrub saplings are transplanted into amended pockets of waste, about one year after the establishment of the herbaceous ground cover. Also, we have found that appropriate acclimation of the saplings, followed by root inoculation with mycorhizal fungi, provides superior results. This approach to woody species establishment has been published in a number of articles, including one of my own technical papers in collaboration with Professor Mizuno, of the Tokyo University of Agriculture. I will dig out some reprints and send them to you, for your files.

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I have discussed the tree situation with the mine, and we have agreed that stocks of native woody material would be best maintained in an on-site nursery, and that transplantation onto vegetated wastes areas is desirable. To this end, I have already forwarded recommended procedures to the mine. In this context, I have attached an extract from SRK Report 29505.3, which describes an appropriate transplantation strategy for later use.

I hope that this explains our approach satisfactorily, and reassures DOGM that we have not overlooked the importance of native tree and shrub planting around the mine property, including those areas proposed for sludge application.

Best wishes,

Dave

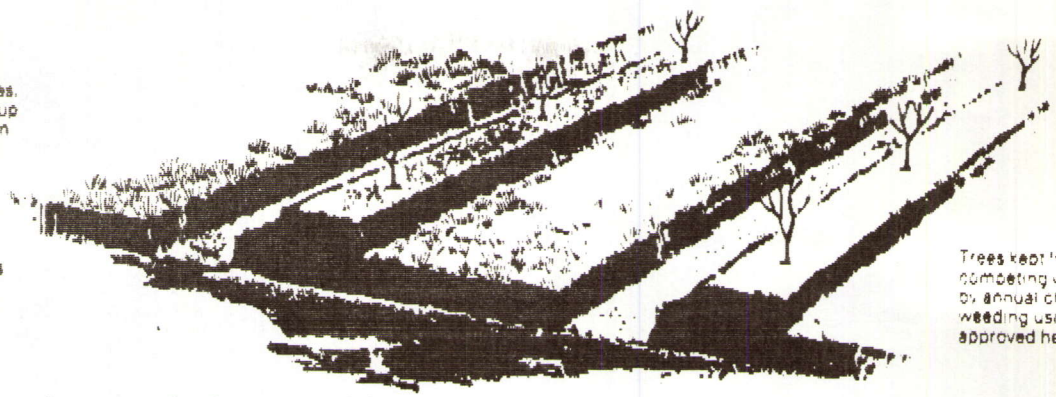
David Morrey

cc: D.I. Hodson Barneys Canyon Mine
S.D. Lackey

Forest and shelter belt planting

Trees planted 1·5 x 1·5 m centres on ploughed ridges, notch planted and firmed up again in late spring. 50 gm of S.A.I. Enmag fertilizer applied around each tree

Single or double furrow ploughing at 1·5 m centres during summer before planting season



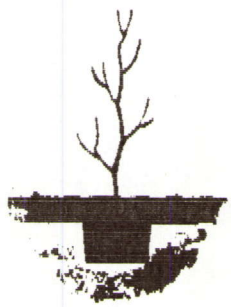
Trees kept free of competing vegetation by annual chemical weeding using approved herbicides

Whips

These slightly larger and more sturdy plants are mainly used for small planting areas where ploughing before planting may not be possible or where a plant sturdy enough to withstand some competition is required.

Whips are normally used, often with feathered whips, to form small spinneys in irregularly shaped areas of land where some early landscape effect is required. Owing to their larger size and the need to give them a good start and keep them free from competition, whips are normally pit-planted.

The sort of planting specification for whips is outlined on right:



Whip Planting
Pit dug approx 25 cm x 25 cm x 25 cm bottom 150 mm loosened. 50 gm of S.A.I. Enmag with topsoil backfill.

Feathered whips

These are a most useful range of planting stocks, varying as they do from 0·9-2·4m in height and fully furnished with side branches. Because of this they are more stable than similar sized standards and can be used with considerable effect for low screening or shelter if mass planted at relatively close spacings of 1·5-1·8m centres.

They are ideal for planting small areas to create spinneys and for narrow screening or sheltering belts where some early effect is required.

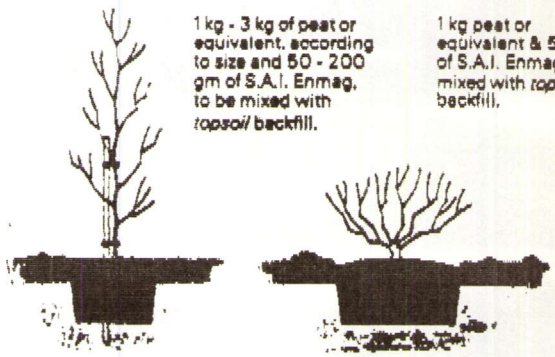
Staking is normally required to get them established, but they do not need such substantial stakes or ties as standard trees particularly if mass planted.

Feathered whips are frequently used in conjunction with ordinary whips and with larger standards to give some body to the finished planting.

These are also ideal for planting as hedgerow trees by virtue of their substance and stability, also some favourite hedgerow species such as Oak and Field Maple are difficult to obtain as standards, but are more readily available as feathered whips around 1·2-1·8m in height.

A typical specification for planting feathered whips is given on right:

Planting Feathered Whips & Shrubs



1 kg - 3 kg of peat or equivalent, according to size and 50 - 200 gm of S.A.I. Enmag, to be mixed with topsoil backfill.

1 kg peat or equivalent & 50 gm of S.A.I. Enmag to be mixed with topsoil backfill.

A temporary tree stake with tree ties for early support may be needed until established.

Excavate pits 15 cm wider than root spread and to a depth of 30 cm fork over bottom 15 cm of pit.

PROJECT NO. 29505	PREPARED BY: STEFFEN ROBERTSON & KIRSTEN (U.S.) Consulting Engineers & Scientists	**FIGURE 2** GUIDE LINES FOR TREE ESTABLISHMENT
DATE 7/93		
REVISION 0		